

2017 NEC General Solar PV System Labeling References

690.13 (B) Marking. Each PV system disconnecting means shall plainly indicate whether in the open (off) or closed (on) position and be permanently marked “PV SYSTEM DISCONNECT” or equivalent. Additional markings shall be permitted based upon the specific system configuration. For PV system disconnecting means where the line and load terminals may be energized in the open position, the device shall be marked with the following words or equivalent:

**WARNING
ELECTRIC SHOCK HAZARD
TERMINALS ON THE LINE AND LOAD
SIDES MAY BE
ENERGIZED IN THE OPEN POSITION**

The warning sign(s) or label(s) shall comply with 110.21(B).

690.31 (G) (3) Marking and Labeling Required. The following wiring methods and enclosures that contain PV system dc circuit conductors shall be marked with the wording **WARNING: PHOTOVOLTAIC POWER SOURCE** by means of permanently affixed labels or other approved permanent marking:

- (1) Exposed raceways, cable trays, and other wiring methods
- (2) Covers or enclosures of pull boxes and junction boxes
- (3) Conduit bodies in which any of the available conduit openings are unused

690.31 (G) (4) Marking and Labeling Methods and Locations. The labels or markings shall be visible after installation. The labels shall be reflective, and all letters shall be capitalized and shall be a minimum height of 9.5 mm (3/8 in.) in white on a red background. PV system dc circuit labels shall appear on every section of the wiring system that is separated by enclosures, walls, partitions, ceilings, or floors. Spacing between labels or markings, or between a label and a marking, shall not be more than 3 m (10 ft). Labels required by this section shall be suitable for the environment where they are installed.

690.53 Direct-Current Photovoltaic Power Source. A permanent label for the dc PV power source indicating the information specified in (1) through (3) shall be provided by the installer at dc PV system disconnecting means and at each dc equipment disconnecting means required by 690.15. Where a disconnecting means has more than one dc PV power source, the values in 690.53(1) through (3) shall be specified for each source.

(1) Maximum voltage

Informational Note to (1): See 690.7 for voltage.

(2) Maximum circuit current

Informational Note to (2): See 690.8(A) for calculation of maximum circuit current.

(3) Maximum rated output current of the charge controller or dc-to-dc converter (if installed)

690.54 Interactive System Point of Interconnection. All interactive system(s) points of interconnection with other sources shall be marked at an accessible location at the disconnecting means as a power source and with the rated ac output current and the nominal operating ac voltage.

690.56 (A) Facilities with Stand-Alone Systems. Any structure or building with a PV power system that is not connected to a utility service source and is a stand-alone system shall have a permanent plaque or directory installed on the exterior of the building or structure at a readily visible location. The plaque or directory shall indicate the location of system disconnecting means and that the structure contains a stand-alone electrical power system.

690.56 (B) Facilities with Utility Services and Photovoltaic Systems. Plaques or directories shall be installed in accordance with 705.10.

690.56 (C) Buildings with Rapid Shutdown. Buildings with PV systems shall have permanent labels as described in 690.56(C)(1) through (C)(3).

(1) Rapid Shutdown Type. The type of PV system rapid shutdown shall be labeled as described in 690.56(C)(1)(a) or(1)(b):

(a) For PV systems that shut down the array and conductors leaving the array:

**SOLAR PV SYSTEM IS EQUIPPED WITH RAPID SHUTDOWN.
TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION
TO SHUT DOWN PV SYSTEM AND REDUCE SHOCK
HAZARD IN ARRAY.**

The title "SOLAR PV SYSTEM IS EQUIPPED WITH RAPID SHUTDOWN" shall utilize capitalized characters with a minimum height of 9.5 mm (3/8 in.) in black on yellow background, and the remaining characters shall be capitalized with a minimum height of 4.8 mm (3/16 in.) in black on white background. [See Figure 690.56(C)(1)(a).]

(b) For PV systems that only shut down conductors leaving the array:

**SOLAR PV SYSTEM IS EQUIPPED WITH RAPID SHUTDOWN
TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION
TO SHUT DOWN
CONDUCTORS OUTSIDE THE ARRAY. CONDUCTORS IN
ARRAY REMAIN
ENERGIZED IN SUNLIGHT.**

The title "SOLAR PV SYSTEM IS EQUIPPED WITH RAPID SHUTDOWN" shall utilize capitalized characters with a minimum height of 9.5 mm (3/8 in.) in white on red background, and the remaining characters shall be capitalized with a minimum height of 4.8 mm (3/16 in.) in black on white background. [See Figure 690.56(C)(1)(b).] The labels in 690.56(C)(1)(a) and (b) shall include a simple diagram of a building with a roof. The diagram shall have sections in red to signify sections of the PV system that are not shut down when the rapid shutdown switch is

operated. The rapid shutdown label in 690.56(C)(1) shall be located on or no more than 1 m (3 ft) from the service disconnecting means to which the PV systems are connected and shall indicate the location of all identified rapid shutdown switches if not at the same location.

(2) Buildings with More Than One Rapid Shutdown Type. For buildings that have PV systems with both rapid shutdown types or a PV system with a rapid shutdown type and a PV system with no rapid shutdown, a detailed plan view diagram of the roof shall be provided showing each different PV system and a dotted line around areas that remain energized after the rapid shutdown switch is operated.

(3) Rapid Shutdown Switch. A rapid shutdown switch shall have a label located on or no more than 1 m (3 ft) from the switch that includes the following wording: **RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM**. The label shall be reflective, with all letters capitalized and having a minimum height of 9.5 mm (3/8 in.), in white on red background.

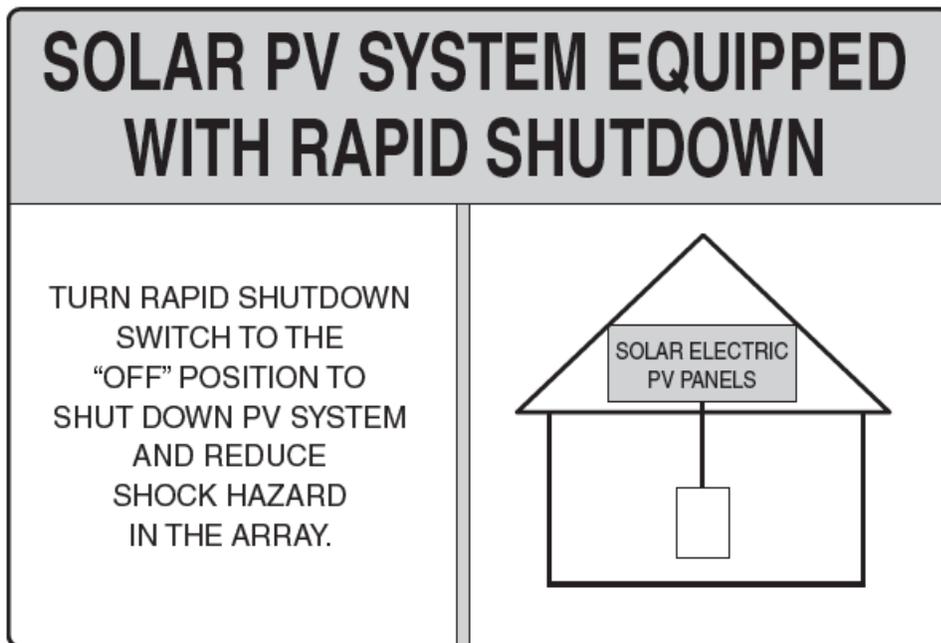


FIGURE 690.56(C)(1)(a) Label for PV Systems that Shut Down the Array and the Conductors Leaving the Array.

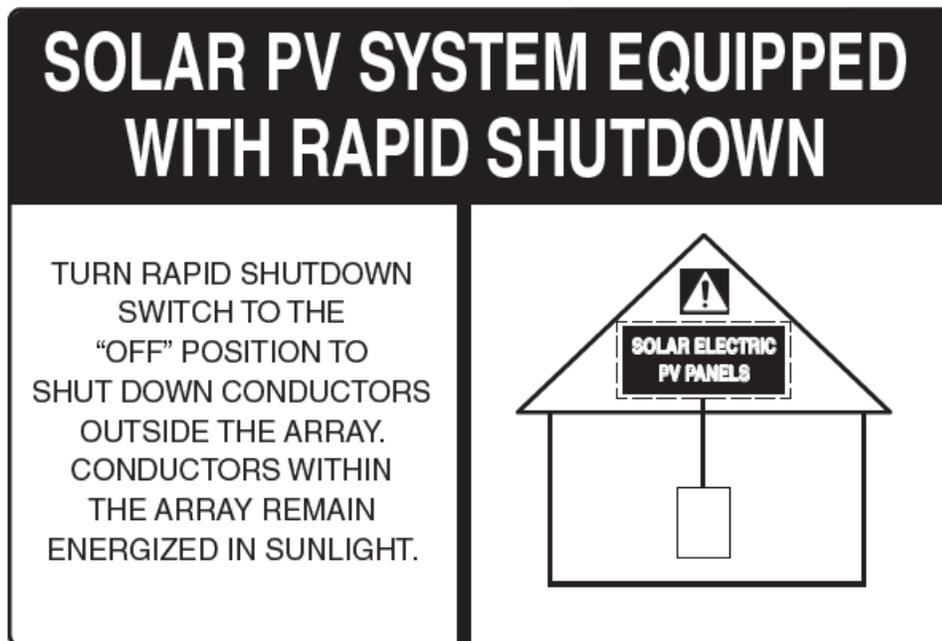


FIGURE 690.56(C)(1)(b) Label for PV Systems that Shut Down the Conductors Leaving the Array Only.

705.12 Directory. A permanent plaque or directory denoting the location of all electric power source disconnection means on or in the premises shall be installed at each service equipment location and at the location(s) of the system disconnect(s) for all electric power production sources capable of being interconnected. The marking shall comply with 110.21(B).

Exception: Installations with large numbers of power production sources shall be permitted to be designated by groups.

705.12 (B) (2) (3) (b) Load Side. Where two sources, one a primary power source and the other another power source, are located at opposite ends of a busbar that contains loads, the sum of 125 percent of the power source(s) output circuit current and the rating of the overcurrent device protecting the busbar shall not exceed 120 percent of the ampacity of the busbar. The busbar shall be sized for the loads connected in accordance with Article 220. A permanent warning label shall be applied to the distribution equipment adjacent to the back-fed breaker from the power source that displays the following or equivalent wording:

WARNING:
POWER SOURCE OUTPUT CONNECTION —
DO NOT RELOCATE THIS OVERCURRENT DEVICE.

The warning sign(s) or label(s) shall comply with 110.21(B).

705.12 (B) (2) (3) (c) Load Side. The sum of the ampere ratings of all overcurrent devices on panelboards, both load and supply devices, excluding the rating of the overcurrent device protecting the busbar, shall not exceed the ampacity of the busbar. The rating of the overcurrent device protecting the busbar shall not exceed the rating of the busbar. Permanent

warning labels shall be applied to distribution equipment displaying the following or equivalent wording:

WARNING:
THIS EQUIPMENT FED BY MULTIPLE SOURCES.
TOTAL RATING OF ALL OVERCURRENT DEVICES
EXCLUDING MAIN SUPPLY OVERCURRENT DEVICE
SHALL NOT EXCEED AMPACITY OF BUSBAR.

The warning sign(s) or label(s) shall comply with 110.21(B).

705.80 Utility-Interactive Power Systems Employing Energy Storage. Utility-interactive power systems employing energy storage shall also be marked with the maximum operating voltage, including any equalization voltage, and the polarity of the grounded circuit conductor.

706.11 Directory. ESS shall be indicated by 706.11(A) and (B). The markings or labels shall be in accordance with 110.21(B).

706.11 (A) Directory. A permanent plaque or directory denoting all electric power sources on or in the premises shall be installed at each service equipment location and at locations of all electric power production sources capable of being interconnected.

Exception: Installations with large numbers of power production sources shall be permitted to be designated by groups.

706.11 (B) Facilities with Stand-Alone Systems. Any structure or building with an ESS that is not connected to a utility service source and is a stand-alone system shall have a permanent plaque or directory installed on the exterior of the building or structure at a readily visible location acceptable to the authority having jurisdiction. The plaque or directory shall indicate the location of system disconnecting means and that the structure contains a stand-alone electrical power system.

710.15 (C) Single 120-Volt Supply. Stand-alone systems shall be permitted to supply 120 volts to single-phase, 3-wire, 120/240-volt service equipment or distribution panels where there are no 240-volt outlets and where there are no multiwire branch circuits. In all installations, the sum of the ratings of the power sources shall be less than the rating of the neutral bus in the service equipment. This equipment shall be marked with the following words or equivalent:

WARNING:
SINGLE 120-VOLT SUPPLY. DO NOT CONNECT MULTIWIRE
BRANCH CIRCUITS!

The warning sign(s) or label(s) shall comply with 110.21(B).